CLAIMS:

What is Claimed is:

1. A composition, comprising:

   a polyol comprising:

   a naturally occurring polyol; and

   a biocompatible, synthetic polyol; and

   isocyanate.

2. The composition of claim 1, further comprising at least one filler material selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

3. The composition of claim 2, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

4. The composition of claim 2, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

5. The composition of claim 2, wherein the at least one filler material is beta tricalcium phosphate.

6. The composition of claim 1 wherein the isocyanate is selected from the group consisting of: an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

7. The composition of claim 6 wherein the aromatic isocyanate is diphenylmethane diisocyanate.

8. The composition of claim 1 wherein the isocyanate is a cycloaliphatic isocyanate.

9. The composition of claim 1 wherein the naturally occurring polyol has at least one hydroxyl group.

10. The composition of claim 9 wherein the naturally occurring polyol is selected from the group consisting of castor oil, safflower oil, lesquerella oil, a polyol obtained by chemical modification of a naturally occurring vegetable oil, a naturally occurring oil that has been trans-esterified and a naturally occurring oil that has been hydrogenated.

11. The composition of claim 1 wherein the biocompatible, synthetic polyol is selected from the group consisting of: a polycaprolactone polyol, a polyester polyol, a polyadipate polyol, and a polyol derived from a synthetic acid.

12. The composition of claim 1 further comprising water.

13. The composition of claim 12 wherein the water is present in an amount sufficient to impart a desired degree of porosity to the composition.

14. The composition of claim 12 wherein the water is present in an amount in the range of from about 0.1% to about 1% by weight.

15. The composition of claim 13 having an average porosity in the range of from about 5 microns to about 500 microns.

16. The composition of claim 1, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

17. The composition of claim 16, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

18. The composition of claim 16, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

19. The composition of claim 1, further comprising at least one protein.

20. The composition of claim 1, wherein the composition further comprises at least one catalyst.

21. The composition of claim 20, wherein the at least one catalyst comprises tertiary amine, or an organometallic compound.

22. The composition of claim 1, further comprising surfactant.

23. The composition of claim 1, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

24. A composition, comprising:

a naturally occurring polyol;

isocyanate; and

water.

25. The composition of claim 24, further comprising at least one filler material selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

26. The composition of claim 5, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

27. The composition of claim 25, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

28. The composition of claim 25, wherein the at least one filler material is beta tricalcium phosphate.

29. The composition of claim 24 wherein the isocyanate is selected from the group consisting of: an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

30. The composition of claim 29 wherein the aromatic isocyanate is diphenylmethane diisocyanate.

31. The composition of claim 24 wherein the isocyanate is a cycloaliphatic isocyanate.

32. The composition of claim 24 wherein the naturally occurring polyol has at least one hydroxyl group.

33. The composition of claim 24 wherein the naturally occurring polyol is selected from the group consisting of castor oil, safflower oil, lesquerella oil, a polyol obtained by chemical modification of a naturally occurring vegetable oil, a naturally occurring oil that has been trans-esterified and a naturally occurring oil that has been hydrogenated.

34. The composition of claim 24 wherein the biocompatible, synthetic polyol is selected from the group consisting of: a polycaprolactone polyol, a polyester polyol, a polyadipate polyol, and a polyol derived from a synthetic acid.

35. The composition of claim 24 wherein the water is present in an amount sufficient to impart a desired degree of porosity to the composition.

36. The composition of claim 24 wherein the water is present in an amount in the range of from about 0.1% to about 1% by weight.

37. The composition of claim 35 having an average porosity in the range of from about 5 microns to about 500 microns.

38. The composition of claim 24, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

39. The composition of claim 38, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

40. The composition of claim 38, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

41. The composition of claim 24, further comprising at least one protein.

42. The composition of claim 24, wherein the composition further comprises at least one catalyst.

43. The composition of claim 42, wherein the at least one catalyst comprises tertiary amine, or an organometallic compound.

44. The composition of claim 24, further comprising surfactant.

45. The composition of claim 24, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

46. A composition, comprising:

a biocompatible, synthetic polyol; and

isocyanate.

47. The composition of claim 46, further comprising at least one filler material selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

48. The composition of claim 47, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

49. The composition of claim 47, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

50. The composition of claim 47, wherein the at least one filler material is beta tricalcium phosphate.

51. The composition of claim 46 wherein the isocyanate is selected from the group consisting of: an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

52. The composition of claim 51 wherein the aromatic isocyanate is diphenylmethane diisocyanate.

53. The composition of claim 46 wherein the isocyanate is a cycloaliphatic isocyanate.

54. The composition of claim 46 further comprising water.

55. The composition of claim 54 wherein the water is present in an amount sufficient to impart a desired degree of porosity to the composition.

56. The composition of claim 54 wherein the water is present in an amount in the range of from about 0.1% to about 1% by weight.

57. The composition of claim 55 having an average porosity in the range of from about 5 microns to about 500 microns.

58. The composition of claim 46, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

59. The composition of claim 58, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

60. The composition of claim 58, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

61. The composition of claim 46, further comprising at least one protein.

62. The composition of claim 46, further comprising surfactant.

63. The composition of claim 46, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

64. A composition, comprising:

a naturally occurring polyol;

an isocyanate prepolymer comprising:

a biocompatible, synthetic polyol; and

isocyanate.

65. The composition of claim 64, further comprising at least one filler material selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

66. The composition of claim 65, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

67. The composition of claim 65, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

68. The composition of claim 65, wherein the at least one filler material is beta tricalcium phosphate.

69. The composition of claim 64 wherein the isocyanate is selected from the group consisting of: an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

70. The composition of claim 69 wherein the aromatic isocyanate is diphenylmethane diisocyanate.

71. The composition of claim 64 wherein the isocyanate is a cycloaliphatic isocyanate.

72. The composition of claim 64 wherein the biocompatible, synthetic polyol is selected from the group consisting of: a polycapralactone polyol, a polyester polyol, a polyadipate polyol, and a polyol derived from a synthetic acid.

73. The composition of claim 64 further comprising water.

74. The composition of claim 73 wherein the water is present in an amount sufficient to impart a desired degree of porosity to the composition.

75. The composition of claim 73 wherein the water is present in an amount in the range of from about 0.1% to about 1% by weight.

76. The composition of claim 74 having an average porosity in the range of from about 5 microns to about 500 microns.

77. The composition of claim 64, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

78. The composition of claim 77, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

79. The composition of claim 77, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

80. The composition of claim 64, further comprising at least one protein.

81. The composition of claim 64, wherein the composition further comprises at least one catalyst.

82. The composition of claim 81, wherein the at least one catalyst comprises tertiary amine, or an organometallic compound.

83. The composition of claim 64, further comprising surfactant.

84. The composition of claim 64, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

85. A composition, comprising:

a crosslinker or chain-extender; and

an isocyanate prepolymer comprising:

a biocompatible, synthetic polyol; and

isocyanate.

86. The composition of claim 85, further comprising at least one filler material selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

87. The composition of claim 86, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

88. The composition of claim 86, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

89. The composition of claim 86, wherein the at least one filler material is beta tricalcium phosphate.

90. The composition of claim 85 wherein the isocyanate is selected from the group consisting of: an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

91. The composition of claim 90 wherein the aromatic isocyanate is diphenylmethane diisocyanate.

92. The composition of claim 85 wherein the isocyanate is a cycloaliphatic isocyanate.

93. The composition of claim 85 wherein the biocompatible, synthetic polyol is selected from the group consisting of: a polycapralactone polyol, a polyester polyol, a polyadipate polyol, and a polyol derived from a synthetic acid.

94. The composition of claim 85 further comprising water.

95. The composition of claim 94 wherein the water is present in an amount sufficient to impart a desired degree of porosity to the composition.

96. The composition of claim 94 wherein the water is present in an amount in the range of from about 0.1% to about 1% by weight.

97. The composition of claim 94 having an average porosity in the range of from about 5 microns to about 500 microns.

98. The composition of claim 85, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

99. The composition of claim 98, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

100. The composition of claim 98, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

101. The composition of claim 98, further comprising at least one protein.

102. The composition of claim 85, wherein the composition further comprises at least one catalyst.

103. The composition of claim 102, wherein the at least one catalyst comprises tertiary amine, or an organometallic compound.

104. The composition of claim 85, further comprising surfactant.

105. The composition of claim 85, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

106. A composition comprising a polyester urethane and at least one filler material, wherein the composition is adapted to stimulate bone growth when the composition contacts or is positioned in the vicinity of a bone of a mammal.

107. The composition of claim 106, wherein the at least one filler material is present in an amount in the range of from about 0.01% to about 30% by weight.

108. The composition of claim 106, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, glass-ionomer, poly ether ether ketone, calcium sulfate, and tricalcium phosphate.

109. The composition of claim 108, wherein the at least one filler material is bone that is selected from the group consisting of demineralized bone, allograft bone, and autogenous bone.

110. The composition of claim 106, wherein the filler material is beta tricalcium phosphate.

111. The composition of claim 106 wherein the polyester urethane is present in an amount in the range of from about 70% to about 99.99% by weight.

112. The composition of claim 106 wherein the polyester urethane is a product of a process comprising the steps of:

forming a first compound by mixing a naturally occurring polyol with a biocompatible, synthetic polyol;

mixing the first compound with isocyanate; and

permitting the first compound and the isocyanate to react to form a polyester urethane.

113. The composition of claim 106 wherein the polyester urethane is a product of a process comprising the steps of:

mixing a naturally occurring polyol with an isocyanate;

permitting the naturally occurring polyol and the isocyanate to react to form a polyester urethane; and

permitting water to be present.

114. The composition of claim 106 wherein the polyester urethane is a product of a process comprising the steps of:

mixing a biocompatible, synthetic polyol with an isocyanate; and

permitting the biocompatible, synthetic polyol and the isocyanate to react to form a polyester urethane.

115. The composition of claim 106 wherein the polyester urethane is a product of a process comprising the steps of

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate;

mixing the isocyanate prepolymer with a naturally occurring polyol oil; and

permitting the isocyanate prepolymer and the naturally occurring polyol to react to form a polyester urethane.

116. The composition of claim 106 wherein the polyester urethane is a product of a process comprising the steps of:

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate;

mixing the isocyanate prepolymer with a crosslinker or chain-extender; and

permitting the isocyanate prepolymer and the crosslinker or chain-extender to react to form a polyester urethane.

117. The composition of claim 106 having an average porosity in the range of from about 5 microns to about 500 microns.

118. The composition of claim 106, further comprising at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance.

119. The composition of claim 118, wherein the at least one substance is at least one radiotransparent substance selected from the group consisting of gas, air, nitrogen gas, carbon dioxide, and oxygen gas.

120. The composition of claim 118, wherein the at least one substance is at least one radiopaque substance selected from the group consisting of insoluble zirconium oxide, a radioactive tracer, a Barium Sulfate contrast media, a gadolinium contrast media, a water-soluble Iodinated contrast media, an oily Iodinated contrast media, and an implantable metal.

121. The composition of claim 106, further comprising at least one protein.

122. The composition of claim 106, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

123. The composition of claim 122 wherein the composition begins to cure at about room temperature at a time in the range of from about 20 minutes to about 30 minutes after formulation.

124. The composition of claim 106 wherein the composition attains a final, cured state within about 48 hours after formulation.

125. The composition of claim 124 wherein the composition in its final, cured state has a compressive strength of at least about 50 MPa.

126. The composition of claim 124 wherein the composition in its final, cured state has a tensile strength of at least about 40 MPa.

127. The composition of claim 124 wherein the composition in its final, cured state has a Modulus of Elasticity of at least about 1,500 MPa.

128. The composition of claim 124, wherein the final, cured composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the final, cured composition.

129. The composition of claim 106, wherein the composition does not comprise any reactive isocyanate.

130. The composition of claim 106, wherein free powder is absent or substantially absent from the final, cured composition.

131. The composition of claim 106, wherein the mechanical properties of the composition are substantially unaffected when it is exposed to sterilization temperatures in an autoclave.

132. The composition of claim 106, wherein the composition is adhesive and cohesive.

133. The composition of claim 106, wherein the composition is bactericidal.

134. The composition of claim 106, wherein the composition is bacterial static.

135. A method of making a composition, comprising the steps of:

forming a first compound by mixing a naturally occurring polyol with a biocompatible, synthetic polyol; and

mixing the first compound with isocyanate.

136. The method of claim 135, further comprising the step of mixing at least one filler material with the first compound and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, poly ether ether ketone, glass-ionomer, calcium sulfate, and tricalcium phosphate.

137. The method of claim 135, wherein the step of forming the first compound further comprises the step of mixing at least one catalyst with the naturally occurring polyol and the biocompatible, synthetic polyol.

138. The method of claim 137, wherein the at least one catalyst is a tertiary amine, or an organometallic compound.

139. The method of claim 135, further comprising the step of mixing surfactant with the first compound and the isocyanate.

140. The method of claim 135, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the first compound and the isocyanate.

141. The method of claim 135, further comprising the step of mixing at least one protein with the first compound and the isocyanate.

142. The method of claim 135, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

143. A method of making a composition, comprising the steps of:

forming a first compound by mixing a naturally occuring polyol with a biocompatible, synthetic polyol;

mixing the first compound with isocyanate; and

permitting the first compound and the isocyanate to react to form a polyester urethane.

144. The method of claim 143, further comprising the step of mixing at least one filler material with the first compound and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, poly ether ether ketone, glass-ionomer, calcium sulfate, and tricalcium phosphate.

145. The method of claim 143, wherein the step of forming the first compound further comprises the step of mixing at least one catalyst with the naturally occurring polyol and the biocompatible, synthetic polyol.

146. The method of claim 145, wherein the at least one catalyst is a tertiary amine.

147. The method of claim 143, further comprising the step of mixing surfactant with the first compound and the isocyanate.

148. The method of claim 143, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the first compound and the isocyanate.

149. The method of claim 143, further comprising the step of mixing at least one protein with the first compound and the isocyanate.

150. The method of claim 145, wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

151. The method of claim 143, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

152. The method of claim 151, wherein the aromatic isocyanate is diphenylmethane diisocyanate.

153. The method of claim 143, wherein the isocyanate is a cycloaliphatic isocyanate.

154. The method of claim 143 wherein the naturally occurring polyol has at least one hydroxyl group.

155. The method of claim 143 wherein the naturally occurring polyol is selected from the group consisting of castor oil, safflower oil, lesquerella oil, a polyol obtained by chemical modification of a naturally occurring vegetable oil, a naturally occurring oil that has been trans-esterified, and a naturally occurring oil that has been hydrogenated.

156. The method of claim 143 wherein the biocompatible, synthetic polyol is selected from the group consisting of: a polycaprolactone polyol, a polyester polyol, a polyadipate polyol, and a polyol derived from a synthetic acid.

157. The method of claim 143, wherein the composition has a porosity, and further comprising the step of controlling the porosity of the composition.

158. The method of claim 157, wherein the composition comprises water, and wherein the step of controlling the porosity of the composition comprises the step of controlling the amount of water that is permitted to be present in the composition.

159. The method of claim 158, wherein the step of controlling the amount of water that is permitted to be present in the composition comprises injecting water into the composition.

160. The method of claim 158, wherein the water is present in the composition in an amount in the range of from about 0.1% to about 1% by weight.

161. The method of claim 158, wherein the step of controlling the porosity of the composition comprises a step selected from the group consisting of: injecting air into the composition, or permitting air to become entrained within the composition.

162. The method of claim 157, wherein the average porosity in the composition is in the range of from about 5 microns to about 500 microns.

163. The method of claim 143, wherein both the first compound and the isocyanate are liquids at room temperature.

164. The method of claim 143, further comprising the step of applying heat while mixing the first compound with isocyanate.

165. The method of claim 143, further comprising the step of removing heat while mixing the first compound with isocyanate.

166. The method of claim 143, wherein the composition is adhesive and cohesive.

167. The method of claim 143, wherein the composition is bactericidal.

168. The method of claim 143, wherein the composition is bacterial static.

169. The method of claim 143, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

170. The method of claim 143, further comprising the step of permitting the composition to attain a final, cured state.

171. The method of claim 170, wherein the composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the composition.

172. The method of claim 170, wherein free powder is absent or substantially absent from the composition.

173. The method of claim 170, wherein the composition does not comprise any reactive isocyanate.

174. The method of claim 170, wherein the mechanical properties of the composition are substantially unaffected when it is sterilized in an autoclave.

175. A method of making a composition, comprising the steps of:

mixing a naturally occurring polyol with isocyanate; and

permitting water to be present in the composition.

176. The method of claim 175, further comprising the step of mixing at least one filler material with the naturally occurring polyol and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, poly ether ether ketone, glass-ionomer, calcium sulfate, and tricalcium phosphate.

177. The method of claim 175, further comprising the step of mixing at least one catalyst with the naturally occurring polyol and the isocyanate.

178. The method of claim 177, wherein the at least one catalyst is a tertiary amine, or an organometallic compound.

179. The method of claim 175, further comprising the step of mixing surfactant with the naturally occurring polyol and the isocyanate.

180. The method of claim 175, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the naturally occurring polyol and the isocyanate.

181. The method of claim 175, further comprising the step of mixing at least one protein with the naturally occurring polyol and the isocyanate.

182. The method of claim 175, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

183. A method of making a composition, comprising the steps of:

mixing a naturally occurring polyol with isocyanate;

permitting the naturally occurring polyol and the isocyanate to react to form a polyester urethane; and

permitting water to be present in the composition.

184. The method of claim 183, further comprising the step of mixing at least one filler material with the naturally occurring polyol and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly methyl methacrylate, poly ether ether ketone, glass-ionomer, calcium sulfate, and tricalcium phosphate.

185. The method of claim 183, further comprising the step of mixing at least one catalyst with the naturally occurring polyol and the isocyanate.

186. The method of claim 185, wherein the at least one catalyst is a tertiary amine.

187. The method of claim 183, further comprising the step of mixing surfactant with the naturally occurring polyol and the isocyanate.

188. The method of claim 183, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the first compound and the isocyanate.

189. The method of claim 183, further comprising the step of mixing at least one protein with the naturally occurring polyol and the isocyanate.

190. The method of claim 185, wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

191. The method of claim 183, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

192. The method of claim 191, wherein the aromatic isocyanate is diphenylmethane diisocyanate.

193. The method of claim 183, wherein the isocyanate is a cycloaliphatic isocyanate.

194. The method of claim 183 wherein the naturally occurring polyol has at least one hydroxyl group.

195. The method of claim 183 wherein the naturally occurring polyol is selected from the group consisting of castor oil, safflower oil, lesquerella oil, a polyol obtained by chemical modification of a naturally occurring vegetable oil, a naturally occurring oil that has been trans-esterified, and a naturally occurring oil that has been hydrogenated.

196. The method of claim 183, wherein the composition has a porosity, and further comprising the step of controlling the porosity of the composition.

197. The method of claim 196 wherein the step of controlling the porosity of the composition comprises the step of controlling the amount of water that is permitted to be present in the composition.

198. The method of claim 197, wherein the step of controlling the amount of water that is permitted to be present in the composition comprises injecting water into the composition.

199. The method of claim 197, wherein the water is present in the composition in an amount in the range of from about 0.1% to about 1% by weight.

200. The method of claim 196, wherein the step of controlling the porosity of the composition comprises a step selected from the group consisting of: injecting air into the composition, or permitting air to become entrained within the composition.

201. The method of claim 196, wherein the average porosity in the composition is in the range of from about 5 microns to about 500 microns.

202. The method of claim 183, wherein both the naturally occurring polyol and the isocyanate are liquids at room temperature.

203. The method of claim 183, further comprising the step of applying heat while mixing the naturally occurring polyol with isocyanate.

204. The method of claim 183, further comprising the step of removing heat while mixing the naturally occurring polyol with isocyanate.

205. The method of claim 183, wherein the composition is adhesive and cohesive.

206. The method of claim 183, wherein the composition is bactericidal.

207. The method of claim 183, wherein the composition is bacterial static.

208. The method of claim 183, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

209. The method of claim 183, further comprising the step of permitting the composition to attain a final, cured state.

210. The method of claim 209, wherein the composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the composition.

211. The method of claim 209, wherein free powder is absent or substantially absent from the composition.

212. The method of claim 209, wherein the composition does not comprise any reactive isocyanate.

213. The method of claim 209, wherein the mechanical properties of the composition are substantially unaffected when it is sterilized in an autoclave.

214. A method of making a composition, comprising the step of mixing a biocompatible, synthetic polyol with an isocyanate.

215. The method of claim 214, further comprising the step of mixing at least one filler material with the biocompatible, synthetic polyol and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

216. The method of claim 215 wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

217. The method of claim 214, further comprising the step of mixing surfactant with the biocompatible, synthetic polyol and the isocyanate.

218. The method of claim 214, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the biocompatible, synthetic polyol and the isocyanate.

219. The method of claim 214, further comprising the step of mixing at least one protein with the biocompatible, synthetic polyol and the isocyanate.

220. The method of claim 214, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

221. A method of making a composition, comprising the steps of:

mixing a biocompatible, synthetic polyol with an isocyanate; and

permitting the biocompatible, synthetic polyol and the isocyanate to react to form a polyester urethane.

222. The method of claim 221, further comprising the step of mixing at least one filler material with the biocompatible, synthetic polyol and the isocyanate, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

223. The method of claim 222 wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

224. The method of claim 221, further comprising the step of mixing surfactant with the biocompatible, synthetic polyol and the isocyanate.

225. The method of claim 221, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the biocompatible, synthetic polyol and the isocyanate.

226. The method of claim 221, further comprising the step of mixing at least one protein with the biocompatible, synthetic polyol and the isocyanate.

227. The method of claim 221, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

228. The method of claim 227, wherein the aromatic isocyanate is diphenylmethane diisocyanate.

229. The method of claim 221, wherein the isocyanate is a cycloaliphatic isocyanate.

230. The method of claim 221, wherein the composition has a porosity, and further comprising the step of controlling the porosity of the composition.

231. The method of claim 230, wherein the composition comprises water, and wherein the step of controlling the porosity of the composition comprises the step of controlling the amount of water that is permitted to be present in the composition.

232. The method of claim 231, wherein the step of controlling the amount of water that is permitted to be present in the composition comprises injecting water into the composition.

233. The method of claim 230, wherein the water is present in the composition in an amount in the range of from about 0.1% to about 1% by weight.

234. The method of claim 230, wherein the step of controlling the porosity of the composition comprises a step selected from the group consisting of: injecting air into the composition, or permitting air to become entrained within the composition.

235. The method of claim 230, wherein the average porosity in the composition is in the range of from about 5 microns to about 500 microns.

236. The method of claim 221, wherein both the biocompatible, synthetic polyol and the isocyanate are liquids at room temperature.

237. The method of claim 221, further comprising the step of applying heat while mixing the biocompatible, synthetic polyol with isocyanate.

238. The method of claim 221, further comprising the step of removing heat while mixing the biocompatible, synthetic polyol with isocyanate.

239. The method of claim 221, wherein the composition is adhesive and cohesive.

240. The method of claim 221, wherein the composition is bactericidal.

241. The method of claim 221, wherein the composition is bacterial static.

242. The method of claim 221, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

243. The method of claim 221, further comprising the step of permitting the composition to attain a final, cured state.

244. The method of claim 243, wherein the composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the composition.

245. The method of claim 243, wherein free powder is absent or substantially absent from the composition.

246. The method of claim 243, wherein the composition does not comprise any reactive isocyanate.

247. The method of claim 243, wherein the mechanical properties of the composition are substantially unaffected when it is sterilized in an autoclave.

248. A method of making a composition, comprising the steps of:

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate; and

mixing the isocyanate prepolymer with a naturally occurring polyol.

249. The method of claim 248, further comprising adding at least one filler material, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

250. The method of claim 249 wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

251. The method of claim 248, wherein the step of forming the isocyanate prepolymer further comprises the step of mixing at least one catalyst with the isocyanate and the biocompatible, synthetic polyol.

252. The method of claim 251, wherein the at least one catalyst comprises a tertiary amine, or an organometallic compound.

253. The method of claim 248, further comprising the step of mixing surfactant with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

254. The method of claim 248, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

255. The method of claim 248, further comprising the step of mixing at least one protein with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

256. The method of claim 248, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

257. A method of making a composition, comprising the steps of:

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate;

mixing the isocyanate prepolymer with a naturally occurring polyol; and

permitting the isocyanate prepolymer and the naturally occurring polyol to react to form a polyester urethane.

258. The method of claim 257, further comprising adding at least one filler material, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

259. The method of claim 258 wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

260. The method of claim 257, wherein the step of forming the isocyanate prepolymer further comprises the step of mixing at least one catalyst with the isocyanate and the biocompatible, synthetic polyol.

261. The method of claim 260, wherein the at least one catalyst comprises a tertiary amine, or an organometallic compound.

262. The method of claim 258, further comprising the step of mixing surfactant with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

263. The method of claim 258, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

264. The method of claim 258, further comprising the step of mixing at least one protein with the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

265. The method of claim 257, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

266. The method of claim 265, wherein the aromatic isocyanate is diphenylmethane diisocyanate.

267. The method of claim 257 wherein the isocyanate is a cycloaliphatic isocyanate.

268. The method of claim 257, wherein the composition has a porosity, and further comprising the step of controlling the porosity of the composition.

269. The method of claim 268, wherein the composition comprises water, and wherein the step of controlling the porosity of the composition comprises the step of controlling the amount of water that is permitted to be present in the composition.

270. The method of claim 269, wherein the step of controlling the amount of water that is permitted to be present in the composition comprises injecting water into the composition.

271. The method of claim 269, wherein the water is present in the composition in an amount in the range of from about 0.1% to about 1% by weight.

272. The method of claim 268, wherein the step of controlling the porosity of the composition comprises a step selected from the group consisting of: injecting air into the composition, or permitting air to become entrained within the composition.

273. The method of claim 268, wherein the average porosity in the composition is in the range of from about 5 microns to about 500 microns.

274. The method of claim 257, wherein the isocyanate prepolymer and the naturally occurring polyol are liquids at room temperature.

275. The method of claim 257, further comprising the step of applying heat while mixing the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

276. The method of claim 257, further comprising the step of removing heat while mixing the isocyanate prepolymer, the naturally occurring polyol, and the at least one filler material.

277. The method of claim 257, wherein the composition is adhesive and cohesive.

278. The method of claim 257, wherein the composition is bactericidal.

279. The method of claim 257, wherein the composition is bacterial static.

280. The method of claim 257, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

281. The method of claim 257, further comprising the step of permitting the composition to attain a final, cured state.

282. The method of claim 281, wherein the composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the composition.

283. The method of claim 281, wherein free powder is absent or substantially absent from the composition.

284. The method of claim 281, wherein the composition does not comprise any reactive isocyanate.

285. The method of claim 281, wherein the mechanical properties of the composition are substantially unaffected when it is sterilized in an autoclave.

286. A method of making a composition, comprising the steps of:

forming an isocyanate prepolymer by mixing isocyanate with a biocompatible, synthetic polyol; and

mixing the isocyanate prepolymer with a crosslinker or chain-extender.

287. The method of claim 286, further comprising the step of mixing at least one filler material with the isocyanate prepolymer and the crosslinker or chain-extender, wherein at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

288. The method of claim 287, wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

289. The method of claim 286, wherein the step of forming the isocyanate prepolymer further comprises the step of mixing at least one catalyst with the isocyanate and the biocompatible, synthetic polyol.

290. The method of claim 289, wherein the at least one catalyst is a tertiary amine, or an organometallic compound.

291. The method of claim 286, further comprising the step of mixing surfactant with the isocyanate prepolymer and the chain-extender or crosslinker.

292. The method of claim 286, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the isocyanate prepolymer and the chain-extender or crosslinker.

293. The method of claim 286, further comprising the step of mixing at least one protein with the isocyanate prepolymer and the chain extender or crosslinker.

294. The method of claim 286, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

295. The method of claim 286 wherein the chain extender is selected from the group consisting of 1,4-butanediol, diethylene glycol, and 1,6 hexanediol.

296. The method of claim 286 wherein the crosslinker is selected from the group consisting of glycerine, trimethylolpropane, a trifunctional castor oil-based polyol, and a quadri-functional castor oil-based polyol.

297. A method of making a composition, comprising the steps of:

forming an isocyanate prepolymer by mixing isocyanate with a biocompatible, synthetic polyol;

mixing the isocyanate prepolymer with a crosslinker or chain-extender; and

permitting the isocyanate prepolymer and the crosslinker or chain-extender to react to form a polyester urethane.

298. The method of claim 297, further comprising the step of mixing at least one filler material with the isocyanate prepolymer and the crosslinker or chain-extender, wherein the at least one filler material is selected from the group consisting of calcium carbonate, bone, calcium phosphate, calcium pyrophosphate, hydroxyapatite, poly ether ether ketone, poly methyl methacrylate, glass-ionomer, calcium sulfate, and tricalcium phosphate.

299. The method of claim 298, wherein the at least one filler material is present in the composition in an amount in the range of from about 0.01% to about 30% by weight.

300. The method of claim 297, wherein the step of forming the isocyanate prepolymer further comprises the step of mixing at least one catalyst with the isocyanate and the biocompatible, synthetic polyol.

301. The method of claim 300, wherein the at least one catalyst is a tertiary amine, or an organometallic compound.

302. The method of claim 297, further comprising the step of mixing surfactant with the isocyanate prepolymer and the crosslinker or chain-extender.

303. The method of claim 297, further comprising the step of mixing at least one substance selected from the group consisting of at least one radiotransparent substance and at least one radiopaque substance with the isocyanate prepolymer and the crosslinker or chain-extender.

304. The method of claim 297, further comprising the step of mixing at least one protein with the isocyanate prepolymer and the crosslinker or chain-extender.

305. The method of claim 297, wherein the isocyanate is selected from the group consisting of an aromatic isocyanate, an aliphatic isocyanate, and a cycloaliphatic isocyanate.

306. The method of claim 305, wherein the aromatic isocyanate is diphenylmethane diisocyanate.

307. The method of claim 297 wherein the isocyanate is a cycloaliphatic isocyanate.

308. The method of claim 297, wherein the composition has a porosity, further comprising the step of controlling the porosity of the composition.

309. The method of claim 308, wherein the composition further comprises water, and wherein the step of controlling the porosity of the composition comprises the step of controlling the amount of water that is permitted to be present in the composition.

310. The method of claim 309, wherein the step of controlling the amount of water that is permitted to be present in the composition comprises injecting water into the composition.

311. The method of claim 309, wherein the water is present in the composition in an amount in the range of from about 0.1% to about 1% by weight.

312. The method of claim 308, wherein the step of controlling the porosity of the composition comprises a step selected from the group consisting of: injecting air into the composition, or permitting air to become entrained within the composition.

313. The method of claim 308, wherein the average porosity in the composition is in the range of from about 5 microns to about 500 microns.

314. The method of claim 297, wherein both the isocyanate prepolymer and the biocompatible, synthetic polyol are liquids at room temperature.

315. The method of claim 297, further comprising the step of applying heat while mixing the isocyanate with the biocompatible, synthetic polyol.

316. The method of claim 297, further comprising the step of removing heat while mixing the isocyanate with the biocompatible, synthetic polyol.

317. The method of claim 297, wherein the composition is adhesive and cohesive.

318. The method of claim 297, wherein the composition is bactericidal.

319. The method of claim 297, wherein the composition is bacterial static.

320. The method of claim 297, wherein the composition is in a moldable state at room temperature for at least about 20 minutes after formulation.

321. The method of claim 297, further comprising the step of permitting the composition to attain a final, cured state.

322. The method of claim 321, wherein the composition further comprises at least one substance selected from the group consisting of a radiotransparent substance and a radiopaque substance, and wherein the presence of the at least one substance does not substantially affect the mechanical properties of the composition.

323. The method of claim 321, wherein free powder is absent or substantially absent from the composition.

324. The method of claim 321, wherein the composition does not comprise any reactive isocyanate.

325. The method of claim 321, wherein the mechanical properties of the composition are substantially unaffected when it is sterilized in an autoclave.

326. A method of performing a medical procedure, comprising at least one step selected from the group consisting of:

applying a particular composition to at least one portion of a bone of a mammal;

positioning the particular composition in the vicinity of the bone;

dispensing the particular composition into an opening formed within or through at least one portion of the bone; and

positioning the particular composition between a first bone portion of the mammal and a second bone portion of the mammal for fusing the first bone portion to the second bone portion, wherein the particular composition:

stimulates bone growth; and

is a product of a process that comprises the steps of:

forming a first compound by mixing a naturally occurring polyol with a biocompatible, synthetic polyol;

mixing the first compound with isocyanate; and

permitting the first compound and the isocyanate to react to form a polyester urethane.

327. The method of claim 326 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

328. The method of claim 327 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

329. The method of claim 326 wherein the isocyanate is a cycloaliphatic isocyanate.

330. The method of claim 326, wherein the particular composition does not comprise any reactive isocyanate.

331. A method of performing a medical procedure, comprising at least one step selected from the group consisting of:

applying a particular composition to at least one portion of a bone of a mammal;

positioning the particular composition in the vicinity of the bone;

dispensing the particular composition into an opening formed within or through at least one portion of the bone; and

positioning the particular composition between a first bone portion of the mammal and a second bone portion of the mammal for fusing the first bone portion to the second bone portion, wherein the particular composition:

stimulates bone growth; and

is a product of a process that comprises the steps of:

mixing a naturally occurring polyol with isocyanate;

permitting the naturally occurring polyol and the isocyanate to react to form a polyester urethane; and

permitting water to be present in the composition.

332. The method of claim 331 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

333. The method of claim 332 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

334. The method of claim 331 wherein the isocyanate is a cycloaliphatic isocyanate.

335. The method of claim 331, wherein the particular composition does not comprise any reactive isocyanate.

336. A method of performing a medical procedure, comprising at least one step selected from the group consisting of:

applying a particular composition to at least one portion of a bone of a mammal;

positioning the particular composition in the vicinity of the bone;

dispensing the particular composition into an opening formed within or through at least one portion of the bone; and

positioning the particular composition between a first bone portion of the mammal and a second bone portion of the mammal for fusing the first bone portion to the second bone portion, wherein the particular composition:

stimulates bone growth; and

is a product of a process that comprises the steps of:

mixing a biocompatible, synthetic polyol with an isocyanate; and

permitting the biocompatible, synthetic polyol and the isocyanate to react to form a polyester urethane.

337. The method of claim 336 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

338. The method of claim 337 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

339. The method of claim 336 wherein the isocyanate is a cycloaliphatic isocyanate.

340. The method of claim 336, wherein the particular composition does not comprise any reactive isocyanate.

341. A method of performing a medical procedure, comprising at least one step selected from the group consisting of:

applying a particular composition to at least one portion of a bone of a mammal;

positioning the particular composition in the vicinity of the bone;

dispensing the particular composition into an opening formed within or through at least one portion of the bone; and

positioning the particular composition between a first bone portion of the mammal and a second bone portion of the mammal for fusing the first bone portion to the second bone portion, wherein the particular composition:

stimulates bone growth; and

is a product of a process that comprises the steps of:

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate;

mixing the isocyanate prepolymer with a naturally occurring polyol; and

permitting the naturally occurring polyol and the isocyanate prepolymer to react to form a polyester urethane.

342. The method of claim 341 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

343. The method of claim 342 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

344. The method of claim 341 wherein the isocyanate is a cycloaliphatic isocyanate.

345. The method of claim 341, wherein the particular composition does not comprise any reactive isocyanate.

346. A method of performing a medical procedure, comprising at least one step selected from the group consisting of:

applying a particular composition to at least one portion of a bone of a mammal;

positioning the particular composition in the vicinity of the bone;

dispensing the particular composition into an opening formed within or through at least one portion of the bone; and

positioning the particular composition between a first bone portion of the mammal and a second bone portion of the mammal for fusing the first bone portion to the second bone portion, wherein the particular composition:

stimulates bone growth; and

is a product of a process that comprises the steps of:

forming an isocyanate prepolymer by mixing isocyanate with a biocompatible, synthetic polyol;

mixing the isocyanate prepolymer with a crosslinker or chain-extender; and

permitting the isocyanate prepolymer and the crosslinker or chain-extender to react to form a polyester urethane.

347. The method of claim 346 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

348. The method of claim 347 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

349. The method of claim 346 wherein the isocyanate is a cycloaliphatic isocyanate.

350. The method of claim 346, wherein the solidified, particular composition does not comprise any reactive isocyanate.

351. A method of performing a medical procedure, comprising the steps of:

forming a mold;

dispensing a liquid, particular composition into the mold, wherein the particular composition solidifies within the mold;

removing the solidified, particular composition from the mold; and

positioning the solidified, particular composition on a bone of a mammal or within an opening formed through or in the bone, wherein:

the positioned, particular composition stimulates bone growth; and

the particular composition is a product of a process that comprises the steps of:

forming a first compound by mixing a naturally occurring polyol with a biocompatible, synthetic polyol; and

mixing the first compound with isocyanate.

352. The method of claim 351 wherein the particular material does not substantially increase in temperature after being positioned on a bone of a mammal or within an opening formed through or in the bone.

353. The method of claim 352 wherein the temperature of the particular material does not substantially increase above about 45 °C after being positioned on a bone of a mammal or within an opening formed through or in the bone.

354. The method of claim 351 wherein the isocyanate is a cycloaliphatic isocyanate.

355. The method of claim 351, wherein the solidified, particular composition does not comprise any reactive isocyanate.

356. A method of performing a medical procedure, comprising the steps of:

forming a mold;

dispensing a liquid, particular composition into the mold, wherein the particular composition solidifies within the mold;

removing the solidified, particular composition from the mold; and

positioning the solidified, particular composition on a bone of a mammal or within an opening formed through or in the bone, wherein:

the positioned, particular composition stimulates bone growth; and

the particular composition is a product of a process that comprises the steps of :

mixing a naturally occurring polyol with isocyanate; and

permitting water to be present in the composition.

357. The method of claim 356 wherein the particular material does not substantially increase in temperature after being positioned on a bone of a mammal or within an opening formed through or in the bone.

358. The method of claim 357 wherein the temperature of the particular material does not substantially increase above about 45 °C after being positioned on a bone of a mammal or within an opening formed through or in the bone.

359. The method of claim 356 wherein the isocyanate is a cycloaliphatic isocyanate.

360. The method of claim 356, wherein the solidified, particular composition does not comprise any reactive isocyanate.

361. A method of performing a medical procedure, comprising the steps of:

forming a mold;

dispensing a liquid, particular composition into the mold, wherein the particular composition solidifies within the mold;

removing the solidified, particular composition from the mold; and

positioning the solidified, particular composition on a bone of a mammal or within an opening formed through or in the bone, wherein:

the positioned, particular composition stimulates bone growth;

and the particular composition is a product of a process that comprises the step of mixing a biocompatible, synthetic polyol with an isocyanate.

362. The method of claim 361 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

363. The method of claim 362 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

364. The method of claim 361 wherein the isocyanate is a cycloaliphatic isocyanate.

365. The method of claim 361, wherein the solidified, particular composition does not comprise any reactive isocyanate.

366. A method of performing a medical procedure, comprising the steps of:

forming a mold;

dispensing a liquid, particular composition into the mold, wherein the particular composition solidifies within the mold;

removing the solidified, particular composition from the mold; and

positioning the solidified, particular composition on a bone of a mammal or within an opening formed through or in the bone, wherein:

the positioned, particular composition stimulates bone growth; and

the particular composition is a product of a process that comprises the steps of:

forming an isocyanate prepolymer by mixing a biocompatible, synthetic polyol with isocyanate; and

mixing the isocyanate prepolymer with a naturally occurring polyol.

367. The method of claim 366 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

368. The method of claim 367 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

369. The method of claim 366 wherein the isocyanate is a cycloaliphatic isocyanate.

370. The method of claim 366, wherein the solidified, particular composition does not comprise any reactive isocyanate.

371. A method of performing a medical procedure, comprising the steps of:

forming a mold;

dispensing a liquid, particular composition into the mold, wherein the particular composition solidifies within the mold;

removing the solidified, particular composition from the mold; and

positioning the solidified, particular composition on a bone of a mammal or within an opening formed through or in the bone, wherein:

the positioned, particular composition stimulates bone growth; and

the particular composition is a product of a process that comprises the steps of:

forming an isocyanate prepolymer by mixing isocyanate with a biocompatible, synthetic polyol; and

mixing the isocyanate prepolymer with a crosslinker or chain-extender.

372. The method of claim 371 wherein the particular material does not substantially increase in temperature after being placed in at least the vicinity of at least one portion of a bone of a mammal.

373. The method of claim 372 wherein the temperature of the particular material does not substantially increase above about 45 °C after being placed in at least the vicinity of at least one portion of a bone of a mammal.

374. The method of claim 371 wherein the isocyanate is a cycloaliphatic isocyanate.

375. The method of claim 371, wherein the solidified, particular composition does not comprise any reactive isocyanate.

376. A kit for promoting bone growth, comprising:

a first container comprising a dispensing means and a first compound; and

a second container comprising a dispensing means and a second compound.

377. The kit of claim 376, wherein the first compound comprises a naturally occurring polyol.

378. The kit of claim 377 wherein the second compound comprises an isocyanate prepolymer comprising isocyanate.

379. The kit of claim 376 wherein the first compound comprises a biocompatible, synthetic polyol.

380. The kit of claim 379 wherein the second compound comprises isocyanate.

381. The kit of claim 376 wherein the first compound comprises a polyol comprising a naturally occurring polyol and a biocompatible, synthetic polyol.

382. The kit of claim 381 wherein the second compound comprises isocyanate.

383. The kit of claim 376, wherein the first container is a syringe.

384. The kit of claim 383, wherein the second container is a syringe.

385. The kit of claim 376 wherein the first container and the second container are packaged in a moisture resistant package.